

## Claims

What we claim as our invention is:

1. A virtual school, comprising:
  - a computer network, including server means and a plurality of clients each of which is adapted to be connected to said server means over said network;
  - means for operating said server means and said plurality of clients, said operating
  - 5 means supporting a run-time environment for a virtual school application on said network;
  - graphical user interface means adapted to be displayed on said plurality of clients, said graphical user interface means including a plurality of personalized spaces;
  - a database storing a plurality of files with a plurality of different file formats;
  - a plurality of collaborative modules, each of which is adapted to be run over said
  - 10 network, said collaborative modules including:
    - a content manager;
    - a curriculum planner;
    - an instructional sequencer; and
    - a progress tracker.
2. The virtual school according to claim 1, wherein said server means comprises:
  - a plurality of web servers;
  - a plurality of application servers, each of which is connected to said plurality of web
  - 5 servers;
  - a file server connected between said database and each of said plurality of application servers; and
  - a database server connected between said database and each of said plurality of application servers.
3. The virtual school according to claim 2, further comprising means for clustering said file server and said database server.
4. The virtual school according to claim 2, further comprising a server dedicated for use by said content manager.

5. The virtual school according to claim 1, wherein said plurality of files stored in said database comprises a plurality of classes and a plurality of objects.

6. The virtual school according to claim 5, wherein said plurality of classes comprise classes selected from the group consisting of content classes, user classes, and role classes.

7. The virtual school according to claim 6, wherein said plurality of objects comprise objects selected from the group consisting of content objects, user objects, and role objects.

8. The virtual school according to claim 7, wherein each said content object constitutes a logical collections of content fields within said database.

9. The virtual school according to claim 7, wherein each said user object defines a user of the virtual school.

10. The virtual school according to claim 9, wherein said user is selected from the group consisting of a plurality of pupils, a plurality of caring adults acting in concert with selected ones of said plurality of pupils, a plurality of system teachers, a plurality of content developers, and a plurality of system administrators administering and supporting the virtual school.

11. The virtual school according to claim 7, wherein each said role object constitutes a logical assembly of possible tasks within the virtual school, based on job functions.

12. The virtual school according to claim 7, wherein each said content object and each said user object is assigned to a particular role object.

13. The virtual school according to claim 1, wherein said plurality of files stored in said database further comprises a plurality of files selected from the group consisting of XML files, graphical files, audio files, video files, and mixed media files.

14. The virtual school according to claim 13, wherein said graphical files include JPEG files, GIF files, and BMP files.

15. The virtual school according to claim 13, wherein said audio files include WAV files and MP3 files.

16. The virtual school according to claim 13, wherein said video files include QIC files, Real files, AVI files, and MPEG files.

17. The virtual school according to claim 13, wherein said media files include SWF files.

18. The virtual school according to claim 1, wherein said plurality of files stored in said database comprises a plurality of series of components.

19. The virtual school according to claim 18, wherein each said series of components includes an element defining a unique identification.

20. The virtual school according to claim 19, wherein said series of components further define a plurality of objects.

21. The virtual school according to claim 20, further comprising a state server connected to each of said plurality of application servers, wherein said state server is adapted to maintain a state of an instance of each of said plurality of objects.

22. A method of operating a virtual school, comprising the steps of:

providing a computer network, including server means and a plurality of clients each of which is adapted to be connected to said server means over said network;

loading a means for operating said server means and said plurality of clients, said operating means supporting a run-time environment for a virtual school application on said network;

providing graphical user interface means adapted to be displayed on said plurality of clients, said graphical user interface means including a plurality of personalized spaces;

connecting a database to said computer network;

storing a plurality of files with a plurality of different file formats in said database;

providing a plurality of interactive modules, each of which is adapted to be run over said network, said interactive modules including:

a content manager;

a curriculum planner;

an instructional sequencer; and

a progress tracker;

managing creation, editing, storage, use of content within said virtual school with said content manager;

planning a curriculum for a pupil using the virtual school with said curriculum planner;

sequencing said curriculum with said instructional sequencer; and

tracking progress of said pupil within said curriculum with said progress tracker.

23. The method according to claim 22, wherein said content manager further comprises a plurality of content objects, a plurality of user objects, and a plurality of role objects.

24. The method according to claim 23, wherein said content manager further comprises a plurality of templates, each of which is adapted to be populated to create, edit, or store said plurality of content objects.

25. The method according to claim 24, wherein said plurality of templates is selected from the group consisting of a unit opener template, a lesson opener template, an activities template, an assessment opener template, a question data template, and an input data template.

26. The method according to claim 25, wherein said unit opener template comprises a plurality of fields including a template number field, a unit title field, a unit focus field, a unit objectives field, a unit text field, a background information field, a lab safety field, a unit assessment field, a design specs field, and a development notes field.

27. The method according to claim 25, wherein said lesson opener template comprises a template number field, a development time and date field, a version number field, an author/developer/designer field, a lesson number field, a lesson type field, a lesson title field, a lesson time field, a lesson focus field, a lesson objectives field, a lesson notes field, a lesson notes  
5 links field, a keywords field, a keyword definitions field, a keyword media files field, a pronunciation guide words field, a pronunciation guide words respellings field, a pronunciation audio files field, a book synopsis field, a synopsis of today's reading field, a resources field, a resources links/media files field, a new words field, a lab safety field, and a development notes field.

28. The method according to claim 25, wherein said activities template comprises an activity type field, an activity modal field, an activity guidance field, an activity delivery field, an activity carryover field, a template type field, a template number field, an activity order field, an activity number field, an activity time field, an activity time field, a things to print field, a things to print media files field, an optional things to print field, and optional things to print number field, an optional things to print media files field, a things to gather field, a things to gather description field, an optional things to gather field, an optional things to gather description field, a things to preview field, a things to preview media files field, a procedure (activity text) field, a procedure media files field, an answers field, a teacher tip field, a teacher tip media files field, a pupil help field, a pupil  
10 help media files field, an extension field, an extension media files field, an alternate activity field, an alternate activity media files field, a design specs field, a narrative text field, and a development notes field.

29. The method according to claim 25, wherein said assessment opener template comprises an opener template number field, an assessment title field, a lesson number field, an assessment time, field, an assessment instructions field, and a PDF file field.

30. The method according to claim 25, wherein said question data comprises an assessment type field, an assessment item type field, an item template number field, a question ID field, a lesson objective covered field, a questions instructions field, a question template number field, a question field, a question media files field, an answer key field, an answer key media files field, and an assessment help field.

31. The method according to claim 25, wherein said input data template comprises an input template number field, a lesson objective covered field, an input instructions field, an input item field, a weight field, an input item media files field, a scoring key field, a design specs field, and a development notes field.

32. In a virtual school system having a computer network, which includes server means and a plurality of clients each of which is adapted to be connected to the server means over the network, means for operating the server means and the plurality of clients, wherein the operating means supports a browser-based, run-time environment for a virtual school application on the network, graphical user interface means adapted to be displayed on the plurality of clients, and a database connected to the computer network storing a plurality of files with a plurality of different file formats, the improvement comprising:

a plurality of browser windows, each of which is adapted to display individual parts of a reading lesson; and

a plurality of tiles, each of which is adapted to be used by a user using the system on one of the plurality of clients in conjunction with said plurality of windows, and each of which includes a given part of speech.

33. The improvement according to claim 32, wherein each of said plurality of browser windows further comprises:

a plurality of text files retrieved from the database, each of which is adapted to teach a given part of said reading lesson to said user; and

a plurality of image files retrieved from the database, each of which is adapted to supplement said given part of said reading lesson.

34. The improvement according to claim 33, wherein said plurality of text files further comprises a plurality of hyperlinks, each of which is adapted to, upon its activation, display another one of said plurality of browser windows in order to supplement said given part of said reading lesson.

35. The improvement according to claim 33, further comprising a plurality of audio files retrieved from the database, and a plurality of mixed media files retrieved from the database.

36. The improvement according to claim 35, wherein said plurality of text files further comprises a plurality of hyperlinks, each of which is adapted to, upon its activation:

display another one of said plurality of browser windows in order to supplement said given part of said reading lesson;

play one of said plurality of audio files in order to supplement said given part of said reading lesson; or

play one of said plurality of mixed media files in order to supplement said given part of said reading lesson.

37. The improvement according to claim 35, wherein each of said plurality of audio files comprises a single phone.

38. The improvement according to claim 35, wherein each of said plurality of audio files comprises a single phoneme.

39. The improvement according to claim 35, wherein each of said plurality of audio files comprises a single allophone.

40. The improvement according to claim 35, wherein each of said plurality of audio files comprises a single morpheme.

41. The improvement according to claim 35, wherein each of said plurality of audio files comprises a sound selected from the group consisting of a single phone, a single phoneme, a single allophone, and a single morpheme.

42. The improvement according to claim 33, wherein each of said plurality of image files comprises a static image.

43. The improvement according to claim 33, wherein each of said plurality of image files comprises a dynamic image.

44. The improvement according to claim 33, wherein each of said plurality of image files is selected from the group consisting of static images and dynamic images.

45. The improvement according to claim 33, wherein each of said plurality of image files has associated therewith a respective one of a plurality of audio files.

46. The improvement according to claim 45, wherein each of said plurality of audio files comprises a sound selected from the group consisting of a single phone, a single phoneme, a single allophone, and a single morpheme.

47. The improvement according to claim 46, wherein each of said plurality of tiles comprises a textual representation of said sound.

48. A method of interactively teaching a pupil to read using a computer system with a display and a database, comprising the steps of:

storing within the database a plurality of browser windows, each of which is adapted to display individual parts of a reading lesson, a plurality of text files, each of which is adapted to teach a given part of said reading lesson to the pupil, and a plurality of image files retrieved from the database, each of which is adapted to supplement said given part of said reading lesson;

operating the computer system to render said plurality of browser windows on the display; and

providing a plurality of tiles, each of which includes a given part of human speech and is adapted to be used by the pupil using the computer system to further supplement said given part of said reading lesson.

49. The method according to claim 48, further comprising the step of directing the pupil to use said plurality of tiles online.



50. The method according to claim 48, further comprising the step of directing the pupil to use said plurality of tiles offline.

51. The method according to claim 48, further comprising the step of directing the pupil to use said plurality of tiles online and offline.

52. The method according to claim 48, further comprising the steps of:  
storing within the database a plurality of audio files, each of which comprises said given part of human speech;  
providing a plurality of hyperlinks in each of said plurality of browser windows;  
5 adapting each of said plurality of hyperlinks, upon its activation by the pupil, to:  
display another one of said plurality of browser windows in order to supplement said given part of said reading lesson;  
play one of said plurality of audio files in order to supplement said given part of said reading lesson; or  
10 play one of said plurality of mixed media files in order to supplement said given part of said reading lesson.

53. The method according to claim 52, further comprising the step of selecting a single phone, a single phoneme, a single allophone, and a single morpheme, or collection thereof to be stored as said given part of human speech.

54. The method according to claim 53, further comprising the step of interactively associating the pupil's use of said plurality of tiles during said reading lesson with a playing of said plurality of audio files.

55. A method of operating a virtual school, comprising the steps of:

providing a computer network, including server means and a plurality of clients each of which is adapted to be connected to said server means over said network;

loading a means for operating said server means and said plurality of clients, said  
5 operating means supporting a run-time environment for a virtual school application on said network;

providing graphical user interface means adapted to be displayed on said plurality of clients;

connecting a database to said computer network;

10 storing within said database a plurality of browser windows, each of which is adapted to display to a user on one of said plurality of clients individual parts of a lesson, a plurality of text files, each of which is adapted to teach a given part of said lesson to said user, and a plurality of image files, each of which is adapted to supplement said given part of said lesson;

operating the computer system to render said plurality of browser windows on the display; and

providing an interactive module, which is adapted to be run over said network and manage creation, editing, storage, use of content within said virtual school.

56. The method according to claim 55, further comprising the step of storing said content as a plurality of objects defined by the group consisting of content objects, user objects, and role objects.

57. The method according to claim 56, further comprising the step of selecting said user from the group consisting of a pupil, a caring adult who is adapted to assist said pupil, a system teacher, a system proctor, a system administrator, a system principal, a system superintendent, a content creator, and a content editor.

58. The method according to claim 57, further comprising the step of associating a level of access to said network to each said pupil, caring adult, system teacher, system proctor, system administrator, system principal, system superintendent, content creator, and content editor, wherein said access level is defined by selected ones of said content objects, said user objects, and said role  
5 objects.

59. A method of operating a virtual school, comprising the steps of:

providing a computer network, including server means and a plurality of clients each of which is adapted to be connected to said server means over said network;

loading a means for operating said server means and said plurality of clients, said operating means supporting a run-time environment for a virtual school application on said network;

providing graphical user interface means adapted to be displayed on said plurality of clients;

connecting a database to said computer network;

storing within said database a first plurality of browser windows, each of which is adapted to display to a user on one of said plurality of clients individual parts of a lesson, a first plurality of text files, each of which is adapted to teach a given part of said lesson to said user, and a first plurality of image files, each of which is adapted to supplement said given part of said lesson;

operating the computer system to render said first plurality of browser windows on the display;

providing a first interactive module, which is adapted to be run over said network and be used by said user to plan a curriculum comprising a plurality of lessons; and

providing a second interactive module, which is adapted to be run over said network and interface with said first interactive module for sequencing said plurality of lessons based on an assessment of said user and said curriculum.

60. The method according to claim 59, further comprising the steps of:

storing within said database a second plurality of browser windows, each of which is adapted to display to a user on one of said plurality of clients an assessment test, a second plurality of text files, each of which is adapted to test said user on a given part of said curriculum, and a second plurality of image files, each of which is adapted to supplement said test, and content created as an assembly of said second plurality of browser windows, said second plurality of text files, and said second plurality of image files; and

storing said content as a plurality of objects defined by the group consisting of content objects, user objects, and role objects.

61. The method according to claim 60, further comprising the steps of:  
creating, from said content, a diagnostic test for assessing an initial performance of  
said user;

administering said diagnostic test with said first interactive module; and  
5 adjusting said curriculum with said second interactive module, based on the results  
of said diagnostic test.

62. The method according to claim 60, further comprising the steps of:  
creating, from said content, a lesson test for assessing a performance of said user at  
an end of said lesson;

administering said lesson test with said first interactive module; and  
5 adjusting said curriculum with said second interactive module, based on the results  
of said lesson test.

63. The method according to claim 60, wherein said curriculum further comprises a  
plurality of units, each of which comprises a plurality of lessons, said method further comprising  
the steps of:

creating, from said content, a unit test for assessing a performance of said user at an  
end of each said unit;

administering said unit test with said first interactive module; and  
adjusting said curriculum with said second interactive module, based on the results  
of said unit test.

64. The method according to claim 60, wherein said curriculum further comprises a  
plurality of courses, each of which comprises a plurality of units, said method further comprising  
the steps of:

creating, from said content, a mid-course test for assessing a performance of said  
5 user at a point in time substantially midway through each said course;

administering said mid-course test with said first interactive module; and  
adjusting said curriculum with said second interactive module, based on the results  
of said mid-course test.

65. The method according to claim 60, wherein said curriculum further comprises a plurality of courses, each of which comprises a plurality of units, said method further comprising the steps of:

creating, from said content, a final test for assessing a performance of said user at an end of each said course;  
administering said final test with said first interactive module; and  
adjusting said curriculum with said second interactive module, based on the results of said final test.

66. The method according to claim 60, wherein said curriculum further comprises a plurality of courses, said method further comprising the steps of:

creating, from said content, a proctored test for assessing a performance of said user at upon completion of said plurality of courses;  
administering said proctored test with said first interactive module; and  
awarding a certificate based on the results of said proctored test.

67. The method according to claim 59, further comprising the step of selecting said user from the group consisting of a pupil, a caring adult, a system teacher, a system proctor, a system administrator, a system principal, and a system superintendent.

68. The method according to claim 67, further comprising the step of assigning a caring adult to one or more pupils.

69. The method according to claim 68, further comprising the step of facilitating user access and communication among a plurality of caring adults who share a selected interest.

70. The method according to claim 69, wherein said selected interest comprises a virtual charter school.

71. The method according to claim 67, further comprising the step of assigning a system teacher to a plurality of pupils.

72. The method according to claim 71, further comprising the step of facilitating user access and communication among a plurality of system teaches who share a selected interest.

73. The method according to claim 72, wherein said selected interest comprises an academic grade level.

74. The method according to claim 72, wherein said selected interest comprises a virtual charter school.

75. The method according to claim 67, further comprising the step of assigning a system principal to a plurality of system teachers.

76. The method according to claim 75, further comprising the step of facilitating user access and communication among said system principal and said plurality of system teachers.

77. The method according to claim 67, further comprising the step of assigning a system superintendent to a plurality of system principals.

78. The method according to claim 77, further comprising the step of facilitating user access and communication among said system superintendent and said plurality of system principals.

79. A method of operating a virtual school, comprising the steps of:

providing a computer network, including server means and a plurality of clients each of which is adapted to be connected to said server means over said network;

loading a means for operating said server means and said plurality of clients, said  
5 operating means supporting a run-time environment for a virtual school application on said network;

providing graphical user interface means adapted to be displayed on said plurality of clients;

connecting a database to said computer network;

10 storing within said database a first plurality of browser windows, each of which is adapted to display to a user on one of said plurality of clients individual parts of a lesson, a first plurality of text files, each of which is adapted to teach a given part of said lesson to said user, and a first plurality of image files, each of which is adapted to supplement said given part of said lesson;

operating the computer system to render said first plurality of browser windows on the display;

providing a first interactive module, which is adapted to be run over said network and be used by said user to plan a curriculum comprising a plurality of lessons, said first interactive module including calendar means accounting for a plurality of vacation days, a plurality of holidays, and a plurality of events occurring throughout the course of said curriculum at a location proximate to said user;

providing a second interactive module, which is adapted to be run over said network and interface with said first interactive module for sequencing said plurality of lessons based on an assessment of said user and said curriculum;

25 creating an assessment test for assessing a performance of said user at a plurality of selected points in time throughout said curriculum;

administering said assessment test with said first interactive module; and

adjusting said curriculum with said second interactive module, based on a combination of factors selected from the group consisting of the results of said assessment test, said  
30 plurality of vacation days, said plurality of holidays, and said plurality of events occurring throughout the course of said curriculum at a location proximate to said user.

80. The method according to claim 79, wherein said curriculum further comprises a plurality of subjects and said method further comprises the steps of:

creating an assessment test for assessing a performance of said user within each one of said plurality of subjects;

5 administering said assessment test with said first interactive module; and

adjusting said curriculum with said second interactive module, based on a combination of factors selected from the group consisting of the results of said assessment test, said plurality of vacation days, said plurality of holidays, said plurality of events occurring throughout the course of said curriculum at a location proximate to said user, and a relevance of each said plurality of events as it relates to each one of said plurality of subjects.

81. A diagnostic and prescriptive curriculum assessment method, comprising the steps of:

providing a computer;

providing an expert system for planning a curriculum, wherein said expert system is operable on said computer;

storing a criterion referenced test (CRT) on said computer, wherein said CRT is adapted to test a pupil using said computer to study said curriculum;

administering said CRT to said pupil;

scoring said administered CRT; and

adapting said curriculum with said expert system.

82. The method according to claim 81, wherein said computer providing step further comprises the steps of:

providing a computer network, which includes server means and a plurality of clients each of which is adapted to be connected to said server means over said network;

5 loading a means for operating said server means and said plurality of clients, said operating means supporting a run-time environment for a virtual school application on said network;

providing graphical user interface means adapted to be displayed on said plurality of clients; and

10 connecting a database to said computer network.



83. The method according to claim 82, further comprising the steps of:

storing within said database a plurality of browser windows, each of which is adapted to display to a user on one of said plurality of clients individual parts of a lesson, a plurality of text files, each of which is adapted to teach a given part of said lesson to said user, and a plurality of image files, each of which is adapted to supplement said given part of said lesson;

operating the computer system to render said plurality of browser windows on the display; and

providing an interactive module, which is adapted to be run over said network and manage the administration of said CRT.

84. The method according to claim 83, further comprising the steps of:

creating a plurality of assessment items for said CRT;

storing said plurality of assessment items in said database, grouped by subject matter; and

assembling selected ones of said plurality of assessment items at runtime, prior to said administering step.

85. The method according to claim 84, wherein said storing of said plurality of assessment items further comprises the steps of:

storing a plurality of math items;

storing a plurality of language arts items;

storing a plurality of science items;

storing a plurality of history items;

storing a plurality of art items; and

storing a plurality of music items.

86. The method according to claim 81, wherein said adapting step further comprises the steps of:

identifying gaps in said pupil's mastery of individual lessons, units, or subjects;

dropping out units in subjects which said pupil has mastered; and

filling in said gaps identified by said CRT with additional lessons.